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VOL. IV, No. 1
January 1940

Foreign Agriculture

. . . . . a Review of Foreign Farm Policy, Production, and Trade

Issued Monthly by
UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF FOREIGN AGRICULTURAL RELATIONS
WASHINGTON, D.C.

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U.S. Dept. of Agric.
Office of Foreign Agric'l Relations
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ARGENTINE PASTURES AND THE CATTLE-GRAZING INDUSTRY . . . . .

By Paul O. Nyhus*

From colonial days the broad plains of the Argentine have produced large numbers of cattle, but there was little incentive to improve their quality or the natural pasture grasses until about 1900 when refrigeration opened up the European markets for frozen and chilled beef. Thereafter, improved pastures, especially of alfalfa, began to play an important part in the industry. The expansion of grain farming has made great inroads on the pasture acreage in some zones; but pastures remain the primary resource of the country, and cattle grazing still competes successfully with grain farming for land even in the heart of the main cereal zone. At present the fattening of steers for the European market depends chiefly upon the excellent alfalfa pastures. Improvement and more intense utilization of the present pasture lands provide ample opportunity for expansion in the cattle industry.

HISTORICAL SKETCH AND PRESENT STATUS

In the history and development of the grazing industry of Argentina the year 1900 is of outstanding significance. This was the year when artificial refrigeration began to be applied in some volume to ocean shipments of beef. This development, which was some 10 or 15 years in being perfected, opened up the European market for Argentine beef; and from this time on livestock and grazing developments with respect to both quantity and quality of production were influenced by the market requirements of Europe.

About 300 years of Argentine history, however, preceded the development of the important export trade in meat. A brief sketch of the colonial period, ended in 1810, and of the subsequent early Republican period is indispensable to an understanding of the far-reaching developments that occurred after 1900 and of the present status of pastures and the grazing industry in Argentina.

When Pedro de Mendoza founded Buenos Aires in 1535, he brought with him 62 horses.[1] The colony was abandoned, but on the second settlement of the city in 1580 the new settlers were surprised to find large numbers of wild horses on the flats

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[1] Background for this historical sketch and quotations contained herein are drawn largely from "La Evolución Ganadera," by Herbert Gibson in *Monografías-Censo Agropecuario Nacional en 1908*.

bordering the River Plate. These settlers from Asunción, Paraguay, brought with them cattle that had originated in Brazil. Sheep from Peru were brought to Tucumán in 1550, but a lot introduced in 1587 is considered the origin of the "countless thousands that wandered over the Pampa and, uncared for, multiplied for well-nigh two and a half centuries." Livestock was pastured around all of the early settlements in the northwest, but as time went on grazing became most important in the alluvial land bordering the Paraná and Uruguay Rivers and on the rich prairies on either side of the River Plate estuary. References to stray cattle appear early in the historical records of the River Plate Colony.

It appears that there was some trading with foreign ships in hides and tallow at an early date. An account of a voyage made in 1658 to the River Plate refers to Dutch and English ships returning home loaded with hides and vicuña wool and reports that the plains were "covered" with cattle. Similarly, an account 70 years later speaks of the "incredible" number of cattle, of which "everyone is allowed to take as many as he wishes provided this does not exceed 10 or 12 thousand."

There was actually little change in the cattle industry from 1650 to 1800: horses and cattle multiplied in a completely wild state throughout the present Pampa region, and Indians hunted and traded cattle with Chile. The wild dog was the herd's worst enemy at that time and was not exterminated until 1860. Although in much smaller numbers, sheep also increased; but they were of little profit to the colony. Only a few were killed and the wool pulled. Cattle and horse hides were the leading items of trade. The contraband traffic was probably greater than legal operations because of the restrictions thrown around trading and exports by the Spanish Government. By 1800, exports of cattle hides to Spain probably totaled close to a million. Salting plants and rendering plants had been constructed a few years earlier and jerked (salted) beef and refined tallow began to appear as export items. See tables 3 and 4, pages 29 and 30.

SIGNIFICANT DEVELOPMENTS AFTER INDEPENDENCE

One of the causes of the Argentine revolution of 1810, or War of Independence, was the desire to trade freely; and, when this desire was realized with the success of the revolution, stimulus was given to livestock raising in the River Plate region. The development of the estancias was adversely affected, however, by internal conflict and foreign complications, which were not removed until 1852 when the dictator Juan Manuel de Rosas was expelled from the country and a constitutional government set up. Events occurred in this period, however, the fruits of which became especially evident after 1852.

The estanciero, described as uniting "all the skill of the gaucho with the intelligence of a class born to lead," had already made his appearance in the latter part of the colonial period and was steadily bringing about an orderly system of management and use of the livestock of that time. Not only were they pioneers in the grazing industry but they led in the campaigns that pushed the Indians farther and farther back until in about 1880 the Pampa was made safe from attacks. The

gaucho, the counterpart of the American cowboy, was described as "a skillful and wise rider and at heart an Arab and a nomad of the plains," who knew how to tame and handle wild herds of cattle and horses.

Although the first importation of merino sheep was probably in 1794, the next shipment, made in 1813, is accredited with introducing and distributing the merino breed in Argentina. It is estimated that at that date the number of sheep did not exceed 3 million head. An interest in crossbred sheep developed; and a beginning was made in exports of wool, until the end of the century the leading item in the Argentine export trade. In 1842, rendering plants for sheep were built, and to the value of sheep skins was added a remunerative and stimulating price for the carcasses. In 1860, the Lincoln breed was introduced. See tables, pages 28 and 29.

Progress was made with respect to domestication of stray herds of cattle; but, because native 4- and 5-year-old steers possessed all the qualities required by an industry limited to the exportation of hides, tallow, and jerked (salted) beef, an incentive to cattle improvement did not exist. The argument of the estancieros of that day against improvement is thus stated: "The salting plant is our only market and it demands a 5-year-old steer with a thick hide and poor flesh so as to be easily salted." The salting industry increased steadily to a peak volume of exports in 1895 and continued to be the main export outlet for beef until 1900. Exports of cattle hides continued to grow in volume. See table 4, page 30.

In 1844, the use for the first time of wire fencing in enclosing estancias, which previously had only sparingly employed ditches for marking boundary lines, introduced a new factor into their organization and into the management of cattle. After about 1880, when grain acreages began to expand, the use of wire fencing developed rapidly.

In 1866, the Argentine Rural Society was organized by a small group of farsighted and enterprising leaders. Its influence and leadership in sponsoring improvements in both the livestock and the grain industries became far reaching, and some Argentineans contend that the formation of the society marked the beginning of modern agriculture in Argentina.

The first purebred Shorthorn bull was introduced into Argentina in 1840, and further and more substantial importations were made of purebred Shorthorn bulls and cows from 1850 to 1860. These animals provided the foundation stock for the early improvement of the native cattle.

Although a beginning was made at this time, there was still little incentive to cattle improvement, and it did not become general until after 1890 or 1900. At that time access by means of refrigerated shipments to the English market and the English demand for a better market type of cattle provided a commercial objective. After that date importations of purebred bulls from England and Scotland and the determined efforts of estancieros resulted in such sharp and general improvement that it would be difficult to parallel the accomplishment in any other country.

EFFECT OF RAILWAY CONSTRUCTION

In the early days of the River Plate Colony, wheat flour was imported, and it was not until about 1875 that a grain acreage located close to the river settlements provided the Republic with practically all of its wheat requirements. The grain and flax acreage made only slow progress until the Indians had been pushed back and railways opened up the interior. Railway construction, which began in the seventies, was especially active in the eighties, and by the end of that decade it had furnished the present Cereal and Livestock Zone with an adequate network of railway transportation. Most of the land some distance away from the river provided such poor native pasture that, given transportation facilities and market outlets, their use for grain or alfalfa was inevitable.

Annual immigration exceeded 100,000 for the first time in 1885. Great inroads began to be made on pasture lands in many parts of the present Cereal and Livestock Zone. The use of sheep lands for wheat and alfalfa is suggested by the decline of sheep numbers in the Pampa from a peak of 58 million in 1895 to 21 million in 1913. Exports of corn and wheat did not permanently exceed 1 million metric tons annually until about 1900.

The earliest alfalfa acreage in Argentina was located in the Provinces of Mendoza and San Luis on irrigated land and used as pasture or feed for cattle en route to markets in Chile. The native pastures immediately away from the fertile wet lands bordering the Paraná River did not provide good pastures; and, when in the eighties it was discovered that alfalfa thrived especially well on the lighter well-drained soils in the western part of the present Cereal and Livestock Zone, progressive estancieros in this region became interested in the growing of alfalfa for fattening steers for market.

The livestock industry thus played a part in introducing grain farming on many tracts in the west. Enterprising estancieros, eager to have the prairie broken up in order to sow alfalfa, induced colonists onto their tracts of land to grow corn and wheat, rent free for several years, whereupon the land was sown to alfalfa. Presumably the practice of giving the use of the land to farmers without rent did not continue long, since soon after the construction of railways grain farming became established on a competitive and permanent basis. As late as 1895, the area in Argentina sown to alfalfa did not exceed 1,759,000 acres, of which only 398,000 acres were located in the Province of Buenos Aires. By that time the demand for fat cattle was beginning to exert some influence on the alfalfa acreage, but a major stimulus to expansion awaited the opening up after 1900 of the market for fat cattle by shipments of frozen and chilled beef. See table 3, page 29.

REFRIGERATION AND EUROPEAN MARKETS

A few years after the invention of the Tellier system of artificial refrigeration in 1872, frozen beef was shipped in growing volume from the United States to England, but there followed about 10 years of trials and experimentation in the

application of refrigeration to meat shipments crossing the Equator. The first freezing plant was built in Argentina in 1882, and shipments thereafter of frozen lamb and mutton became a successful and established practice. Shipments began with 17,565 carcasses in 1883, rose to 108,323 in 1884, and reached 1,000,000 in 1899.

Success in shipping frozen beef in any volume from Argentina was delayed until about 1900, and as late as 1908 jerked beef provided an important export outlet for beef. In the meantime, efforts were made to ship live cattle; and in some years prior to 1900, when the trade came to a sharp decline with the closing of the British market due to an outbreak of foot-and-mouth disease in Argentina, cattle shipments reached 100,000 head. See table 3, page 29.

The development of frozen- and chilled-beef exports from Argentina is inseparably related to the growth of population and the disappearance of exportable supplies in the United States and to increased meat requirements in England and on the Continent that resulted from industrial expansion. In 1903 the exports of frozen and chilled beef from the United States to England reached 298 million pounds. Although showing a declining tendency, these exports were fairly well maintained until 1907; but in 1908 they fell off sharply and continued to drop until in 1912 they practically disappeared.

The Argentine export trade followed an opposite course. Exports increased from 3 million pounds in 1895 to 53 million pounds in 1900. After that date the expansion was rapid: 330 million pounds in 1905, 548 million pounds in 1910, 1,071 million pounds in 1918, and 1,315 million pounds in 1924. An almost complete shift from chilled- to frozen-beef exports took place during the war, but chilled-beef exports assumed their leading place a few years after the war. From the high level of the period 1924 to 1927, exports declined in 1928 and reached the low average of 839 million pounds for the years 1933 to 1935. From this low level there was a recovery in 1938 to 981 million pounds.

Of even greater importance than the expansion in exports of frozen and chilled beef and other packing-house products in providing a market for an increased production of beef has been the expansion in domestic consumption. Per-capita consumption of beef is especially high in Argentina, and the population has grown from 4,607,000 in 1900 to 12,761,000 in 1938. As a result, at the present time about 70 percent of the estimated slaughter is believed to be for domestic consumption. The production of dairy products not only has kept pace with the growth of population and domestic requirements but has attained an export status for butter, cheese, and casein.

With the completion of railway lines into the interior and with heavy immigration, which reached 379,000 in 1912, the expansion that took place in grain farming and alfalfa acreage after 1895 might be difficult to duplicate in the history of any other country. The grain and flax acreage trebled from 1895 to 1910, and the alfalfa acreage rose to 11,532,000 acres, or more than six times the 1895 area. Nor did expansion stop here. As the packing industry became more firmly established - particularly after 1907 when American packers brought to the Argentine their experience and capital and provided more competitive conditions in the buying

of cattle - the demand by packers and the premiums paid for well-bred fat cattle stimulated both the improvement of cattle and the growing of alfalfa on which to fatten steers. As the market outlet in England and the Continent continued to expand, the alfalfa acreage in Argentina was also extended. A peak alfalfa acreage of 20,695,000 acres was reached in 1922 - almost double the 1910 acreage - corresponding very closely with the peak in the exports of frozen and chilled beef from Argentina.

In recent years some major shifts in the grain and livestock industries have occurred. During the World War, prices of cattle were considerably better than of grain, with the result that the grain industry declined and the cattle industry continued to expand. Cattle numbers rose from 26 million head in 1914 to 37 million in 1922. With a sharp break in cattle prices in 1924, however, and with prices of grain relatively better from 1923 to 1928, the grain acreages not only recovered their pre-war level but expanded 40 percent from 1924 to 1929. Pasture lands were turned over to tenant grain farmers in this period, and cattle numbers declined to 32 million according to the 1930 census. Since 1930 there have been trends in crop and pasture acreages in different localities, but for the country as a whole the grain and livestock industries appear to have maintained quite a stable relationship to each other. The 1937 census reports 33 million head of cattle, and the total grain and flaxseed acreage has remained at approximately the 1930 level.

This sketch of agricultural developments in Argentina would be incomplete without emphasizing the comparative newness of the cattle and grazing industry in its present form. Many of the pioneers who began the improvement of cattle and the fattening of steers on alfalfa pastures are still living. Some of the largest cattle feeders are men who themselves bought land in the west and created estancias after 1900. In general, however, ownership has descended to the sons of the founders of the modern estancias, and the second generation is active in the administration and operation of these properties. It is only rarely that the third generation has come into possession. The raising of fat steers for the English market did not attain great importance until after 1907, and many contend that it was the World War and the resulting market for beef that gave the Argentine cattle industry its present pattern and led to the current volume of breeding and fattening operations.

ARGENTINE PASTURES

CATTLE-GRAZING REGIONS RESTRICTED

Pastures have a special importance in Argentina, not only because the pasture acreage is of great extent, but also because the cattle and sheep industries are almost exclusively grazing industries. Steers are finished on pastures, and only in times of extreme drought is some corn used to fatten them. Owing to the entire dependence on pastures, the kind, quality, and number of livestock in different districts are determined directly by the quality of the pastures. There are possibly few countries in which returns from pastures and returns from crops compete as directly as they do in Argentina.

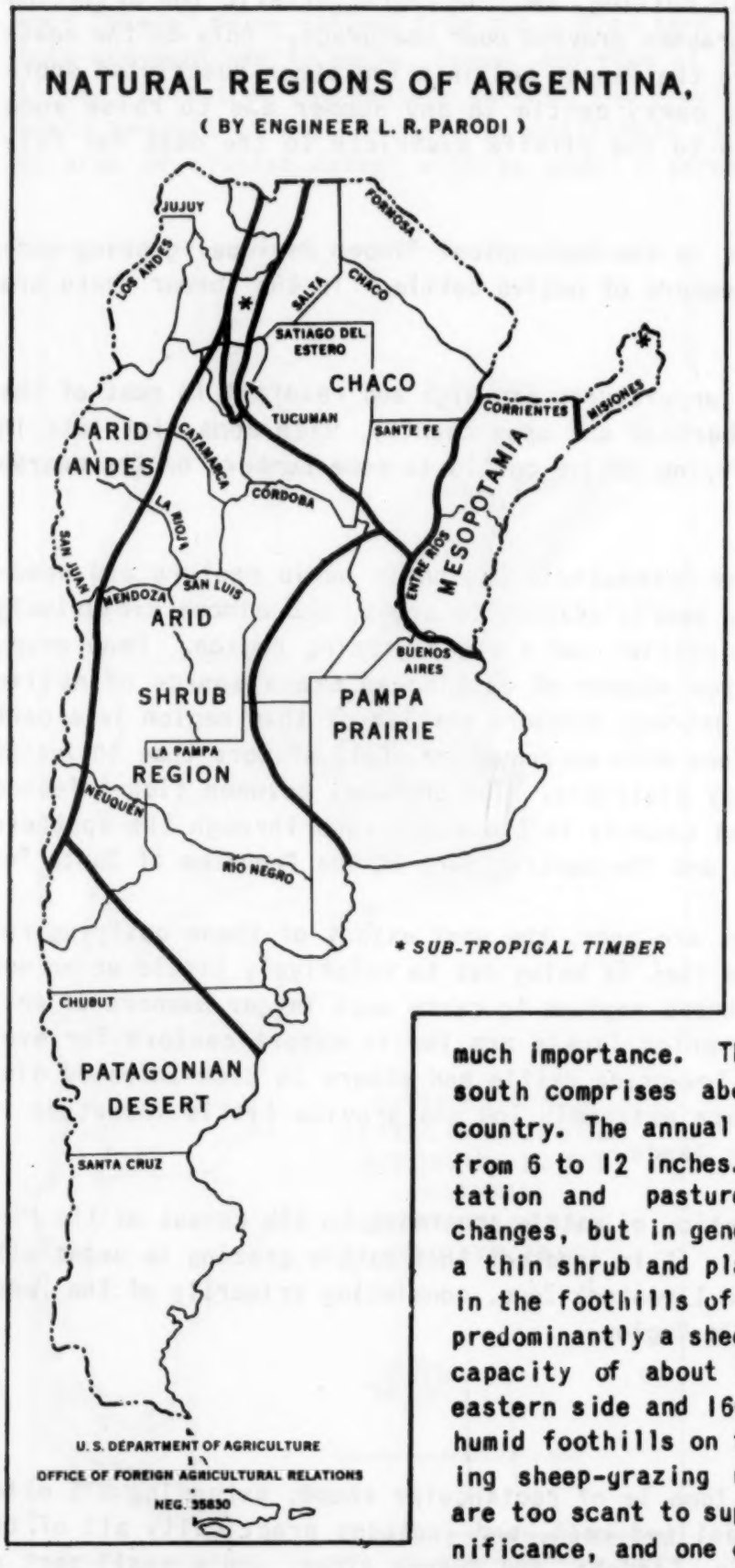

Figure 1.

At the outset it must be emphasized that climatic and soil conditions vary greatly in different parts of Argentina and that favorable rainfall and soil conditions are restricted to a relatively small part of the total area of the country. No detailed botanical studies of the natural regions of Argentina have been made; but Lorenzo R. Parodi, of the University of Buenos Aires, has outlined and described eight natural regions, which are reproduced in figure 1. Only three of these regions, lying to the northeast and comprising about one-third of the land area of Argentina, are of primary importance for cattle grazing - the Pampa, Mesopotamia, and the Chaco. One region, the Pampa, includes the bulk of what is usually referred to as the main Cereal and Livestock Zone of Argentina.

It will be evident from the description of the other regions why cattle grazing outside of these three has never attained much importance. The Patagonian Desert in the extreme south comprises about one-fifth of the area of the country. The annual rainfall in different parts ranges from 6 to 12 inches. There is some variation in vegetation and pasture conditions associated with these changes, but in general the arid region supports only a thin shrub and plant growth. Some cattle are grazed in the foothills of the Andes in the north, but it is predominantly a sheep-grazing country with a carrying capacity of about 80 head per 1,000 acres along the eastern side and 160 head per 1,000 acres in the more humid foothills on the western side. It is the leading sheep-grazing region of Argentina; but pastures are too scant to support a cattle industry of any significance, and one or two of the larger cities on the Atlantic Coast of this region are supplied with fresh beef shipped in coast steamers from the main Cereal and Livestock Zone to the north.

In the western part of the Arid Shrub Region (monte) the annual rainfall declines to 4 inches from about 18 inches on the eastern side. The soil is sandy and gravelly, the topography is flat to rolling, and the characteristic low arid-type shrubs and trees and patchy, hard grasses provide poor pasturage. Only on the eastern edge of this district, close to the Pampa, and in a few other restricted spots are pastures sufficiently good to carry cattle in any number and to raise some feeder steers, which are driven in to the alfalfa districts to the east for fattening.

In the Arid Andes Region and in the Subtropical Timber Regions, grazing conditions support relatively small numbers of native cattle. In the former there are more goats than sheep.

In the Chaco to the north, temperatures are high and rainfall in most of the region is light. It is mixed timberland and open country, with some districts in the more humid eastern portion carrying native cattle in some numbers on the coarse semitropical native grasses.

The northern portion of the Mesopotamia Region is humid pasture and woodland, rolling and rough in places, poorly adapted to crops, and almost exclusively in native pastures. It is both a cattle- and a sheep-grazing region. Many properties in this region carry a large number of cattle and are a source of native steers for canning purposes. The extreme southern portion of this region is a part of the main Cereal and Livestock Zone with an annual rainfall of more than 40 inches and with good pasture lands in many districts. The boundary between tick-infested country in the north and tick-free country in the south runs through the southern part of the Province of Entre Ríos and the central part of the Province of Santa Fe.

Although pasture conditions are poor, the vast extent of these outlying regions and the great amount of land that is being put to relatively little or no use undoubtedly make it possible for these regions to carry much larger numbers of cattle; but, in a country where the price levels are low in export centers for even well-finished steers, prices for low-grade cattle and steers in tick-infested districts far removed from markets are extremely low and provide little incentive to better utilization of the grazing lands.

Figure 2 shows the distribution of cattle according to the census of the Ministry of Agriculture made in 1930. It is apparent that cattle grazing is especially concentrated in the main Cereal and Livestock Zone, consisting primarily of the Pampa and a small part of the Mesopotamia Region.

THE CEREAL AND LIVESTOCK ZONE

The Cereal and Livestock Zone is of rectangular shape, extending 575 miles north and south and 360 miles east and west, and includes practically all of the Provinces of Entre Ríos, Santa Fe, Córdoba, and Buenos Aires, and a small part of the Territory of La Pampa, or an area approximately equal to the combined area of

Illinois, Iowa, and Missouri. With the exception of a range of hills in the southern part of the Province of Buenos Aires, the entire zone is extremely flat - the word "pampa" being derived from the Indian term meaning "a prairie." Trees and wood lots are confined to parks, lanes, and rows of trees set out by hand along boundary lines. Except in the eastern part of the Province of Buenos Aires, there are only small amounts of wet, swampy, or untillable land. It would be difficult to find an area of similar extent with as small a percentage of waste land.

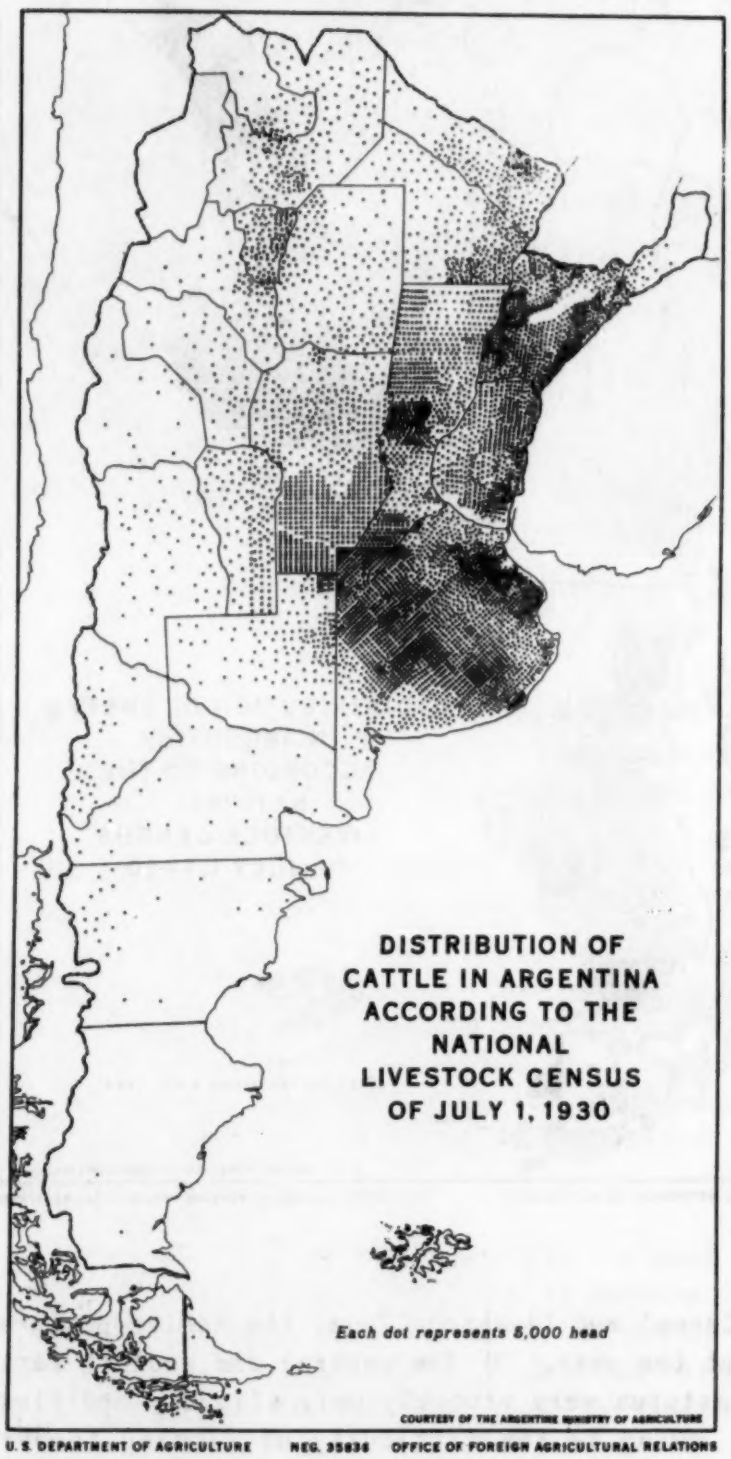
DISTRIBUTION OF
CATTLE IN ARGENTINA
ACCORDING TO THE
NATIONAL
LIVESTOCK CENSUS
OF JULY 1, 1930
Each dot represents 5,000 head
COURTESY OF THE ARGENTINE MINISTRY OF AGRICULTURE
U. S. DEPARTMENT OF AGRICULTURE NEG. 35836 OFFICE OF FOREIGN AGRICULTURAL RELATIONS

Figure 2.

It has been said of Iowa that variation in rainfall can account to a very small degree for differences in farming types found within the State. Possibly one of the most distinctive features of the Argentine Cereal and Livestock Zone, however, is the great variation, considering the size of the area, in the amount and seasonal distribution of the rainfall. Annual precipitation ranges from more than 40 inches in Entre Ríos on the eastern side to 13 inches on the western edge of the wheat and alfalfa zone - or within a distance at about 350 miles. It is difficult to find a corresponding change in a corresponding distance in the Great Plains region of the United States, except possibly in Kansas. Because of the difference in temperature between the northern and southern limits of the zone associated with a difference of 9 degrees in latitude (from 30^0 to 39^0 S.) and with other factors, there is a range in vegetation from tall, semitropical, coarse grasses in the north to short, tender grasses in the south. Frosts occur throughout the zone in the winter months and are frequent in the southern part, but the ground rarely freezes.

There are no soil surveys for Argentina, but some generalizations are possible. The central region, on which the corn acreage is concentrated, consists of a fertile black silt soil, 2 feet in

depth, overlying a brown subsoil about 5 feet in depth. It ranks among the best soil types in the world. To the north of this region, soils contain somewhat more clay and are less friable; nevertheless, they are fertile and productive. In the northwest, west, and southwest, the soils are lighter both in texture and in color and become progressively sandier and poorer from east to west. In the eastern part of the Province of Buenos Aires are low, poorly drained soils; and in the south are black prairie soils, impaired in many places by nearness to the surface of the underlying limestone rock.

Associated with these broad aspects of the climate and soil of the main Cereal and Livestock Zone are variations in yields, regional specialization in crops, and pasture conditions.

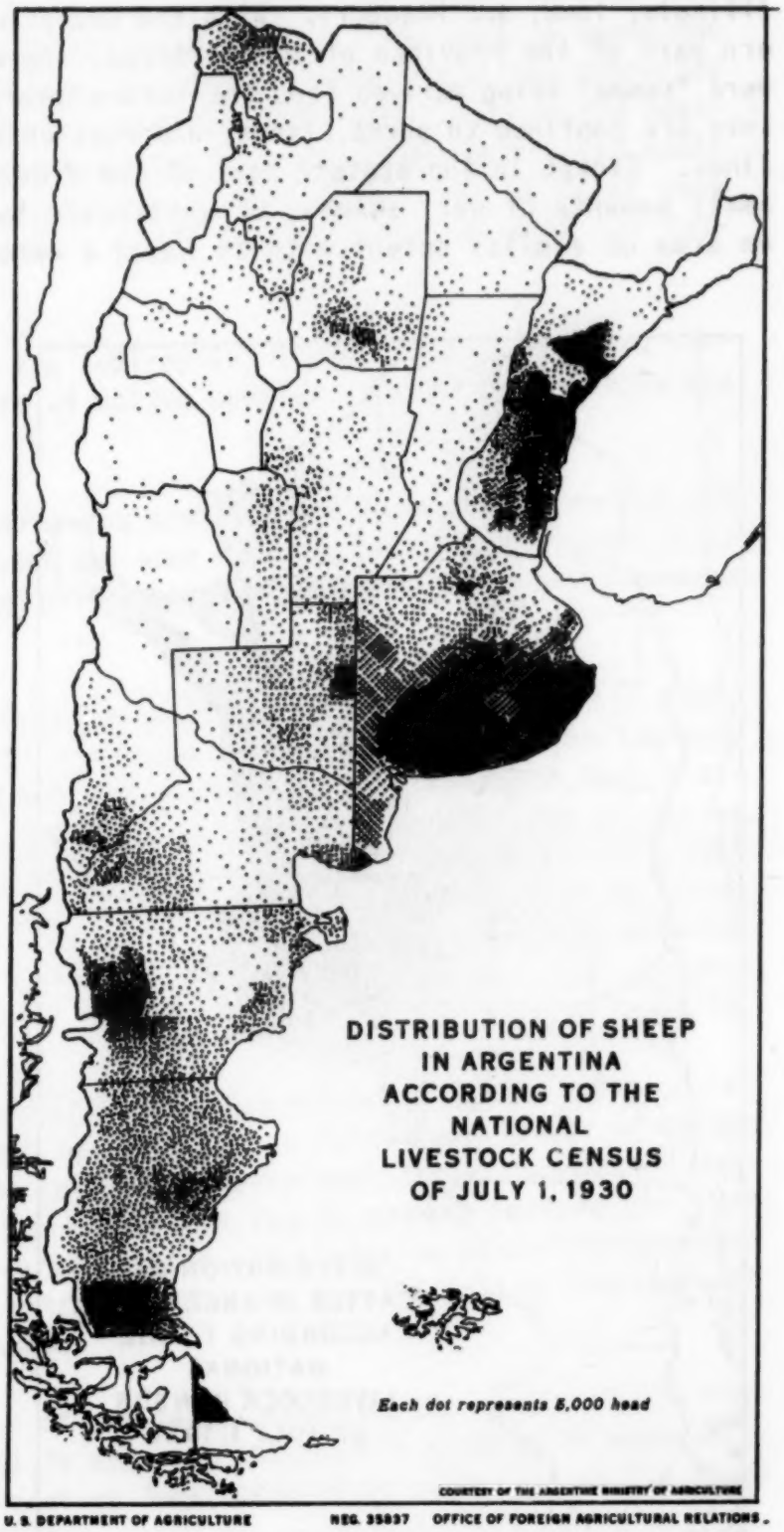

Figure 3.

ARGENTINE PASTURE GRASSES

Through adaptation to the long seasonal droughts, most of the native grasses formerly grown, and still grown to some extent, consisted of drought-resistant plants with hard, narrow leaves - still referred to as "hard pastures." They dried up for 3 or 4 months in the hot, relatively dry summer and again in the winter. In the east, the introduction of imported varieties, as well as actual grazing, improved and modified the hard pastures. Because of the humid, fertile soil in the eastern part of the Cereal and Livestock Zone, the native pasture lands tended to remain green throughout the year. In the central and western part the native, hard, drought-resistant pastures were probably only slightly modified and improved until alfalfa was sown, owing to the difficulty of finding tender grasses that would thrive under the rainfall, temperature, and soil conditions of

those parts of the Pampa. It is said that the native prairies that were broken up for sowing to alfalfa consisted chiefly of lands covered with high-growing, hard, wiry grasses.[2] Some of these grasses still grow in low waste places in the west. In the east the native grasses make a comparatively tight sod, but to the west they become thinner and thinner.

Figure 4. - Shorthorn cattle in the Argentine pampa. (Courtesy of the Argentine Rural Society.)

With regard to the native grasses of the Argentine Pampa, Parodi states: "It is surprising that as it is a grass plain par excellence with more than 300 indigenous species of grasses, it has contributed to world agriculture only two species of secondary importance, Schrader's bromegrass, or rescue grass *(Bromus catharticus)*, and Dallis grass *(Paspalum dilatatum)*, and a decorative species, pampasgrass *(Cortaderia dioica)* distributed today in parks and gardens throughout the world."

As previously indicated, except for the natural grasslands of the eastern part of the cereal zone, the native grasses in most of the Pampa provided too poor pasturage for the native pastures to remain as soon as attention was given to improving the carrying capacity and grain farming began to compete for use of the land. Many landowners say that displacement of native grasses by improved pastures took place very rapidly about the turn of the century. At the present time they have been almost completely displaced by improved pastures and grain farming except on the heavy natural grasslands in the eastern part of the Province of Buenos Aires and in Entre Ríos.

The expansion of world markets for beef and livestock products in the period around 1900 stimulated an interest in pasture improvement, and foreign grasses from many sources were introduced and tried out by the estancieros. Many grasses were advertised and were popular for a time but failed to have the qualities necessary to retain a permanent or important place as pasture grasses in Argentina.

[2] of the genera *Stipa*, *Poa*, *Briza*, and *Melica*.

After reviewing these trials with imported varieties, an agricultural botanist, Carlos D. Girola, wrote in 1916 of the pasture plants at that time: "Alfalfa is queen of forage in Argentina. Each year its acreage increases. It has an acreage greater than that sown to any other plant in the country. It already exceeds 7,500,000 hectares [18,533,000 acres] and it will soon cover 10,000,000 hectares [24,710,000 acres] - figures too eloquent to require further comment. After alfalfa the other grasses that contribute most to the encouragement of livestock breeding in Argentina are the various species of ryegrass, particularly the Italian [*Lolium multiflorum*] and various species of bromegrass, particularly the native. These are often mixed and unidentified in Argentine pastures. Around these varieties, which comprise the basis of Argentina's improved pastures, and found in a greater or lesser degree also in natural pastures are clustered other Gramineae, such as various *Paspalum* and other so-called sweet grasses, *Poa* [meadow grass], *Festuca* [fescue grass], and to a lesser degree legumes."

An owner of several estancias, who has himself carried on experimental and test work with various grasses, contends that the situation today is almost identical with that described in 1915; i.e., no new grasses especially adapted to Argentine conditions have been discovered and several species of bromegrass and ryegrass continue to be the most important species in both improved and native pastures, supplemented by cultivated alfalfa, oats, rye, barley, corn, and Sudan grass. The improved and cultivated pastures of Argentina, accordingly, consist largely of these few species, used almost entirely for pasture, most of which in the United States are grown chiefly as hay and grain crops.[3]

Figure 8. - Hereford cows on native Argentine pastures. (Courtesy of the Argentine Rural Society.)

[3] To these species of primary importance should be added a list of grasses of secondary importance found in native and improved pastures: Dallis grass (*Paspalum dilatatum*), *Bromus malachoides*, bur-clover (*Medicago denticulata*), *Stipa neesiana*, *Briza triloba*, *Vulpia dertonensis*, white clover (*Trifolium repens*) silver beardgrass (*Andropogon saccharoides*), and carpet grass (*Axonopus compressus*).

In relation to the acreage of native and improved pastures the acreage of alfalfa and other cultivated pastures is small. A comparison of the alfalfa acreage (1933-34) with the sown acreages of oats, rye, and barley for 1938-39 indicates the relative areas devoted to these pasture crops: Alfalfa 13,880,000 acres; oats 3,361,000; rye 2,254,000; and barley 2,053,000. It was estimated by the Ministry of Agriculture that one or more cuttings of hay were taken from 40 percent of the alfalfa acreage. Of the sown acreages of oats, rye, and barley the harvested acreages were about 50 percent, 30 percent, and 65 percent, respectively. The unharvested acreages were pastured areas from which no grain crop was obtained. In addition, a considerable part of the harvested acreages was also pastured, but the cattle were removed early enough in the spring to enable a grain crop to be harvested. The statistics, accordingly, for oats, rye, and barley are not strictly for pastured acreages; nevertheless, they serve to indicate the importance of these crops as supplementary pastures.

There are many weeds and noxious plants in Argentina, among which the thistles as a group are probably the most injurious. Two of these, *cardo asnal*, or milk thistle, *(Silybum marianum)* and musk thistle *(Carduus nutans)*, are particularly harmful and lower the carrying capacity of a great many pastures. The large flat leaves of the first crowd out the grass, and by midsummer the thistle reaches a height of fully 5 feet. It gives an appearance of waste and neglect to many pastures on the heavier lands. A special large steel roller pulled by horses, with cutting blades attached as lugs to the roller, has been devised for use in cutting the plants close to the roots. Because of the size of many of the properties, however, the control of these and other thistles represents a big item of labor and is frequently not attempted. Regulations prohibiting the distribution of Sudan grass and other seeds contaminated with Johnson grass are very rigid.

PASTURE CONDITIONS IN THE VARIOUS AREAS

With respect to soil and climate, conditions on the eastern side of the Cereal and Livestock Zone are favorable for natural grasslands but decline progressively to the west. A division between relatively favorable and unfavorable conditions follows the 35-inch rainfall line located just west of the Paraná River and extending southward to Mar del Plata on the Atlantic coast. See figure 6. The high temperatures that prevail in the northern part of the zone impair natural grazing conditions.

On an unpublished map to which the writer has had access, Parodi has tentatively divided the Pampa into eight or nine different areas according to botanical, soil, and other conditions. Since the botanical differences between areas are not always marked, a division into four areas, Northern, Eastern, Southwestern, and Western, will serve the essential purpose of this study. These areas represent sufficiently distinctive pasture conditions to explain differences in the grazing industry in the various parts of the Argentine Pampa. See figure 7.

The natural tree and shrub growth that characterizes the Chaco region marks the northern boundary of the *Northern* Area, and the appearance of tight, poorly

drained soils unsuitable for crop production, the southern boundary. Included in this area, which has an annual rainfall of from 30 to 40 inches, are the best soils of Argentina. They are dark, deep, and fertile and, combined with favorable climatic conditions and proximity to river ports, have made possible the high agricultural development of this area. A large part of the land is used for corn, flaxseed, and wheat.

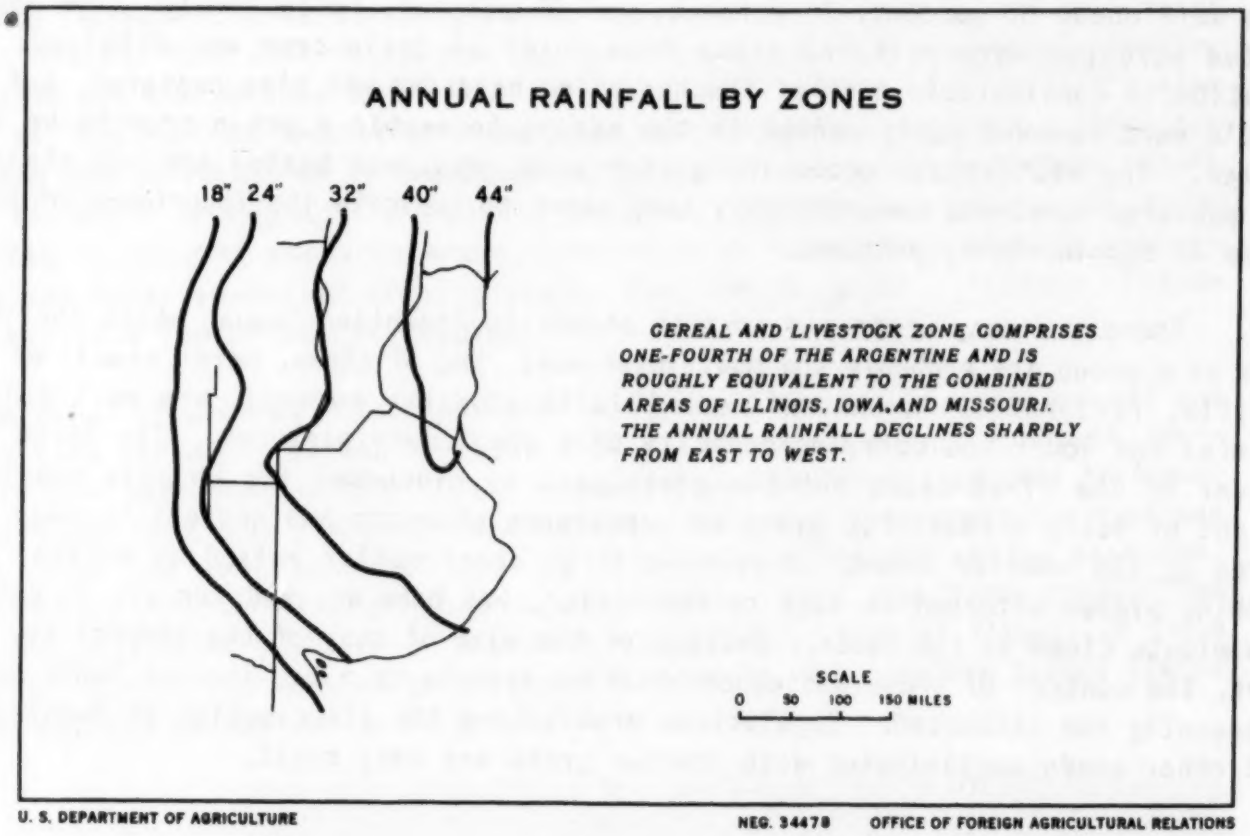
ANNUAL RAINFALL BY ZONES
18"
24"
32"
40"
44"
CEREAL AND LIVESTOCK ZONE COMPRISES ONE-FOURTH OF THE ARGENTINE AND IS ROUGHLY EQUIVALENT TO THE COMBINED AREAS OF ILLINOIS, IOWA, AND MISSOURI. THE ANNUAL RAINFALL DECLINES SHARPLY FROM EAST TO WEST.
SCALE
0 50 100 150 MILES
U. S. DEPARTMENT OF AGRICULTURE
NEG. 34478 OFFICE OF FOREIGN AGRICULTURAL RELATIONS

Figure 6.

Alfalfa does well and is a leading form of pasture, much of which is intensively used in dairying. More alfalfa is cut for hay here than in other parts of the Pampa. Except in low, poorly drained spots, native grasses have been replaced almost entirely by improved pastures of alfalfa and certain species of bromegrass and ryegrass, white clover, and several species of bur-clover. Land values are higher, farms are smaller, and there is a closer approximation to mixed farming here than in any other part of the country. In no other area does crop production offer so much competition for the use of the land, but substantial acreages are nevertheless devoted to grazing.

The *Eastern* Area consists primarily of the eastern and central parts of the Province of Buenos Aires, but the southern part of Entre Ríos is also included because of the extent of native pastures in the latter Province. The area consists chiefly of the Salado River Basin, which is a low-lying, poorly drained district with tight subsoils and large acreages frequently flooded; but it also includes well-drained lands to the north and the natural pasture lands around the Tandil and Balcarce Hills to the south of the Salado River Basin, not especially suitable for

crop production. The area receives an annual rainfall of from 35 to 40 inches, and pastures tend to remain green throughout the year. The area is being left almost entirely in pasture, crop acreages being extremely small. Native grasses grow here to a greater extent than in any other area, and alfalfa does not thrive.[4] Land of this character, or pasture country, surrounds the city of Buenos Aires, and a dairy industry has been established there with Shorthorn cattle, which supplies the bulk of the city's market-milk requirements.

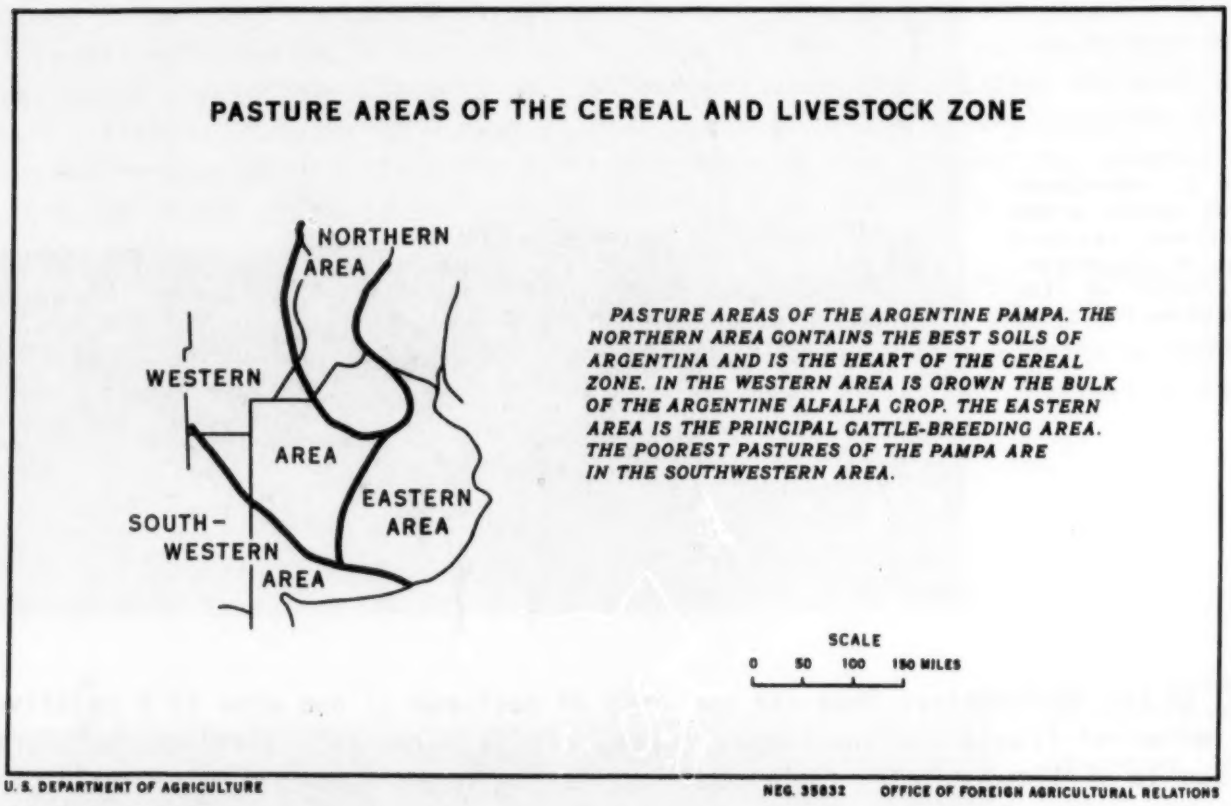
PASTURE AREAS OF THE CEREAL AND LIVESTOCK ZONE
NORTHERN AREA
WESTERN AREA
EASTERN AREA
SOUTH-WESTERN AREA
PASTURE AREAS OF THE ARGENTINE PAMPA. THE NORTHERN AREA CONTAINS THE BEST SOILS OF ARGENTINA AND IS THE HEART OF THE CEREAL ZONE. IN THE WESTERN AREA IS GROWN THE BULK OF THE ARGENTINE ALFALFA CROP. THE EASTERN AREA IS THE PRINCIPAL CATTLE-BREEDING AREA. THE POOREST PASTURES OF THE PAMPA ARE IN THE SOUTHWESTERN AREA.
SCALE
0 50 100 150 MILES
U. S. DEPARTMENT OF AGRICULTURE
NEG. 35832 OFFICE OF FOREIGN AGRICULTURAL RELATIONS

Figure 7.

Pastures in this area are not good enough to finish steers for the export market, but the area carries large numbers of cattle and it is an important breeding region from which yearling steers are shipped to the alfalfa region for fattening. It is known, accordingly, as a *vaca de cría* or cattle-breeding area of Argentina, as distinct from the *invernadero,* or cattle-wintering and cattle-fattening alfalfa area of the west; but the practice of fattening some steers here is increasing, and for this purpose larger acreages of oats and rye are being sown as winter pasture. The carrying capacity of the pastures in this breeding area is one cow to about 2½ acres.

The *Southwestern* and the *Western* Areas have some characteristics in common. In both districts soils become progressively sandier and the climate progressively drier to the west, but the nearness to the surface of an underlying bed of limestone

[4] It is difficult to indicate the relative importance of the native grasses in this area, but of leading importance are the previously mentioned species of the genera *Bromus*, *Lolium*, *Paspalum*, *Stipa*, *Briza*, *Andropogon*, and *Trefolium*.

rock explains basic differences between the two areas in vegetation and pasture. The Southwestern Area is a part of a much larger region referred to as the *tosca* or limestone-rock region. In general, the soil covering over the limestone rock in this area varies from 2 to 4½ feet in depth, but frequently the limestone rock appears on the surface. It is too shallow a soil for alfalfa, which is confined to spots here and there where the soil is deepest. The boundary between this and the Western Area is determined by soils sufficiently deep for alfalfa to do well.

Figure 8. - Aberdeen-Angus cattle on the treeless pasture land of Argentina. (Courtesy of the Argentine Rural Society.)

In the Southwestern Area the poorness of pastures is due also to a relatively long period of frosts and low temperatures. It is known as a short-pasture-grass area and is utilized chiefly for sheep. It is the least important for cattle grazing in the entire Pampa. In the western part of this area, because of its shallowness and sandy character, the soil has a limited water-holding capacity. This, combined with the seasonal character of the rainfall and the high winds, causes pastures to be dry frequently for many months of the year.

The entire Southwestern Area, but especially the southern part, is better grain land than grazing land. Oats do especially well along the coast, where a heavy sheep-grazing area has been developed, relying principally upon oat and rye pastures. Owing to the sandy and depleted character of the soils in the western part of this area, a system of crop rotation and mixed farming is urgently needed; but it is difficult to find satisfactory pasture grasses that will support livestock enterprises of importance. Russian thistle and *Bassia hyssopifolia*, a member of the goosefoot family, which come up on idle land, and volunteer wheat and rye on plowed lands provide grazing for horses and sheep. Alfilaria *(Erodium cicutarium)* is also an important pasture species here.

The Western Area has an annual rainfall of from 24 to 34 inches. The soils are lighter than they are farther east and become more and more sandy to the west. Soil blowing is a problem in the extreme west, and sand dunes occur here and there.

In general, the soils are deep and well-drained and alfalfa thrives especially well. Grazing conditions are less satisfactory in the part of this area located in the Province of Córdoba, and water for livestock is frequently not good.

Especially because of the ease with which alfalfa grows and the fact that the climate is too dry for corn and the soils too light to support continuous wheat farming, most of this area has developed into a highly specialized grazing area for fattening steers on alfalfa and supplementary pastures. Large acreages of rye, oats, and barley are sown for winter pasture, and Sudan grass and corn are used to supplement the alfalfa pasture in the late summer. The bulk of the 14 million acres of alfalfa in Argentina is located in this Western Area, and the reputation of the Argentineans for fattening steers on pastures was made here. Either alone or growing with alfalfa, considerable feed is also provided by the several species of ryegrass and bromegrass, by "alfilerillo" *(Geranium rotundifolium)*, by several burclovers and other clovers, and by various self-seeding grasses.

Landowners estimate a steer to each 2½ acres, and visitors to Argentina are impressed with the excellent pastures and their high carrying capacity. Some alfalfa is cut for hay in this area, but in relation to the total alfalfa acreage the amount is small. It is put up in stacks in the open fields and provides a reserve against seasons of extremely poor pastures.

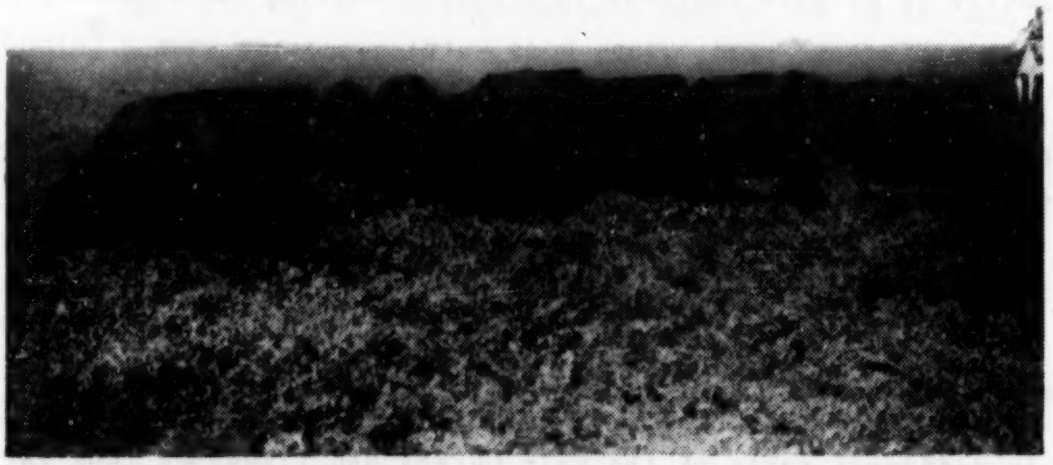

Figure 9.-Young cows on alfalfa pasture in Argentina. (Courtesy of the Argentine Rural Society.)

Alfalfa provides good pasture from September to April; corn and Sudan grass supplement these pastures in February and March; rye, oat, and barley pastures are relied upon for quick gains and for finishing steers from June to September. Pasturing wheat is a relatively new development and not practiced much to date. It is recognized that the oat and rye pastures are the best but that alfalfa is the cheapest. If spring pasture conditions are good, the cattle are taken off the oat, rye, and barley pastures by the middle of September, or early enough for these crops to make a harvest of grain. Partly because of less satisfactory results than formerly

with alfalfa, the use of these supplementary pastures is increasing and larger acreages are being sown. On some of the large properties - of 100,000 acres or so - as much as 7,000 acres are sown each year to rye and oats; and in order to maintain the alfalfa acreage about 10 percent of the area of the estancia is each year reseeded with alfalfa.

Alfalfa in this area is usually sown alone in the fall months of April and May and can be pastured in December. Frequently it is combined with thinly sown rye used for pasture during the winter. On an estancia in this region, the writer recently examined a field that has raised alfalfa continuously since 1906 but which has been plowed and sown with alfalfa only twice - in 1906 when the prairie was broken and again in 1924. The success to date in maintaining yields of alfalfa grown almost continuously for more than 30 years under the annual rainfall conditions of this area is undoubtedly due to the fortunate circumstance that the water table has in part supplied the moisture requirements of the alfalfa plants.

The life of a new seeding of alfalfa, however, is less now than formerly, and in general more difficulty is being experienced in growing good crops. When alfalfa was first grown in this area, an alfalfa field was good for from 10 to 15 years, but now the life of a new seeding is from 5 to 8 years. The poorer results with alfalfa are attributed chiefly to a depletion of subsoil moisture. It is said that about 20 years ago the water table in much of this area was from 10 to 12 feet from the surface but that, owing in part to heavy cropping, it has now dropped to 20 or 25 feet. Alfalfa is able, presumably, to continue to utilize capillary moisture from a water table at these depths, and yields are probably not dependent entirely on annual rainfall (from 24 to 34 inches); but the impairment of yields and of the carrying capacity of alfalfa pastures is a matter causing deep concern to cattlemen.

Damage by the *tucura* - one of the species of locusts - has been, and continues to be, a serious problem and frequently necessitates the reseeding of comparatively new alfalfa fields.

GRAZING VERSUS GRAIN FARMING

FACTORS INFLUENCING LAND UTILIZATION

Conditions in different parts of the main Cereal and Livestock Zone vary greatly with respect to comparative returns from grazing and grain farming, which determine the use of the land. A vast district in the eastern part of the Province of Buenos Aires and districts in Entre Ríos and northern Santa Fe are unsuitable for crop production, and there is practically no alternative but to leave the land almost in its entirety for grazing. Much of the main Cereal and Livestock Zone, however, consists of land capable of raising wheat, corn, or flax. See figure 10.

Corn yields are high in a relatively small central district of deep black soils where rainfall conditions are favorable, especially during the hot months of

December and January. Here the grazing industries have been displaced by grain farming to a greater degree than in any other region, but even here pastures occupy large acreages. The rainfall declines sharply from east to west of this central district. For this reason and because of sandier soils, corn yields decline sharply, and the crop quickly disappears from the cropping system. Much of the acreage in the outlying districts is used for raising cattle fodder, thus cleaning the land for wheat or alfalfa. The district in which corn does well and competes effectively with other crops and pastures is exceedingly small.

Flax yields are high on the good soils in the center of the zone, but the bulk of the acreage is on land to the north and in Entre Ríos where corn yields are relatively poor and where pasture conditions are likewise only fair.

It will be noted that the wheat acreage forms a crescent on the western side of the Cereal and Livestock Zone. Rainfall here is too light for corn and flax, and much of the soil is sandy. The conditions of competition between wheat and pasture for the use of the land in this western crescent-shaped district vary greatly from south to north. Along the coast in the south pastures are poor; but, because of quite fertile soils and favorable seasonal rainfall, wheat and oats do well, and the small grains occupy from 65 to 75 percent of the land area in some counties. The large acreage of wheat in the southwest consists of land on which, owing to the thin soil covering and in part to the sandy character of the soil, alfalfa does not thrive and pastures are poor. Much of this wheat acreage is land recognized as absolutely poor, too poor to provide even fair pasture and support a grazing industry with as good returns even as the low and declining yields of wheat.

Soil blowing in the southwestern part of the Cereal and Livestock Zone is becoming a more serious problem each year. Some people now contend that the native pastures in much of this region should not have been plowed up and destroyed. To the north, the soils, although sandy, are deeper; and in a large region including the western part of the Province of Buenos Aires and the southern part of the Province of Córdoba alfalfa does especially well, better comparatively than wheat. Here the grazing industry is highly developed and firmly entrenched in competition with grain farming. In the extreme northwest a heavy concentration of the wheat acreage and a corresponding decline of the grazing industry is explained by somewhat smaller yields of alfalfa, poorer conditions for livestock, dry summers, and satisfactory yields of wheat.

As a result of crop and grazing competition, the proportion of the land area in pastures in 1934 varied in different parts of the Cereal and Livestock Zone as is indicated in figure 10. Only in a central corn and linseed district and in a small wheat district in the extreme south do pastures occupy less than 50 percent of the land area. Over larger districts, pastures occupy more than 90 percent of the land area. Land utilization by no means follows a rigid program but shows many evidences of sensitivity and response to changing comparative advantage.

The ability of the grazing and livestock industries to retain such an important place on grain lands is due, in great part, to the ease with which alfalfa grows

in most of the Cereal Zone. No one can see the alfalfa pastures in Argentina, which provide excellent feed for 7 or 8 months of the year and some feed throughout the year, without being convinced that this crop is one of the leading agricultural assets of the country and a leading factor in the successful competition of the grazing industry with grain farming on a vast acreage.

The large pasture acreage is explained also by the prevailing system of very low land taxes, large landholdings, and, given sufficient capital, the ease with which these tracts are operated as cattle and sheep estancias. The capital requirements are considerable with respect to the investment in land, fences, and cattle or sheep; but the estancias represent much the simplest means of administering large holdings. They provide the only system by which the owners can personally direct and manage operations on such large tracts, of which the minimum size is about 5,000 acres. The income from cattle and sheep, moreover, is more constant and dependable than from crops, and it is said that since 1930 the returns from livestock, or from estancias, have been uniformly as good as, or better than, from grain.

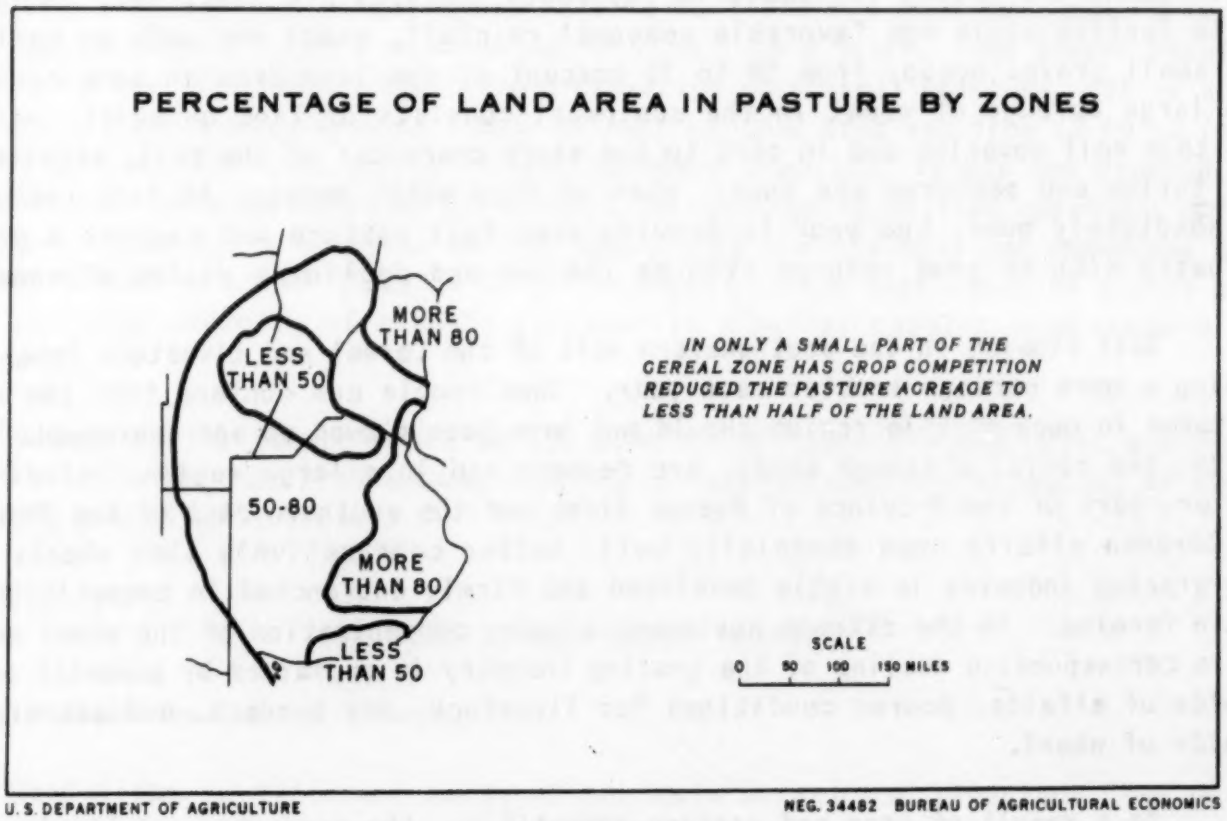
PERCENTAGE OF LAND AREA IN PASTURE BY ZONES
MORE THAN 80
LESS THAN 50
50-80
MORE THAN 80
LESS THAN 50
IN ONLY A SMALL PART OF THE CEREAL ZONE HAS CROP COMPETITION REDUCED THE PASTURE ACREAGE TO LESS THAN HALF OF THE LAND AREA.
SCALE
0 50 100 150 MILES
U.S. DEPARTMENT OF AGRICULTURE
NEG. 34482 BUREAU OF AGRICULTURAL ECONOMICS

Figure 10.

Converting a tract of grazing land into tenant grain farms involves other considerations, however, besides that of financial returns. Livestock grazing has been the traditional source of wealth in Argentina, and there is a social and economic standing associated with it. The estancias are institutions reflecting wealth, a manner of living, and, in many respects, an agricultural aristocracy - the closest parallel to which in the United States disappeared with slavery and the large cotton plantations of the South. Shifting to grain farming is the end of personal direction

of extensive herds and flocks and more especially of the manner of living associated with the estancias. No longer is the former estanciero the director of actual operations; he is now concerned with administrative matters involving scores to hundreds of tenants, many of whom are difficult and unreliable.

But most observers in Argentina recognize that substantial amounts of the present grazing land are being inadequately and poorly utilized and that only the wealth of some of the old landowning families and their income from large tracts has enabled them to carry on as inefficiently as they have and as insensitive to low financial returns, if not losses. Rising land values before the depression and ability to mortgage their properties for large amounts enabled many to persist in a tradition and to postpone changes and adjustments demanded by relatively low returns and poor management; but since 1929 more and more attention is being given to the better utilization of properties. This involves improvement in pastures, shifting to grain farming in some localities, and more careful management.

SPECIALIZATION IN GRAZING AND IN GRAIN FARMING

Possibly one of the most distinctive features of the organization of agriculture in Argentina is the extent to which crop and livestock farming are separated and carried out as independent and highly specialized types of farming. This separation is reflected in the terms *estancia* and *chacra*, *estanciero* and *chacarero*, referring, respectively, to a livestock farm and a grain farm, a livestock farmer and a grain farmer, which are significant and necessary distinctions in Argentina. Usually when estancia owners wish to cultivate a portion of the estancia, tenant farmers are called in for that purpose; but there are many estancias on which 2,500 or 5,000 acres of grain are planted by men employed by the owner.

The explanation for the degree of separation of grain and livestock farming operations is to be found in the size of the landholdings. Most of the estancias consist of from 6,000 to 12,000 acres; but as an indication of larger holdings there are 50 families with holdings in excess of 75,000 acres each in the Province of Buenos Aires. The labor supply on the estancias is usually not large enough to engage to any considerable extent in the relatively intensive operations of grain farming, and relatively few estancia owners add to their management and administration problems by hiring additional farm hands and engaging in grain farming on any significant scale. Lack of capital on the part of tenant farmers, conditions of tenancy, and lack of interest and ability of tenant farmers tend to restrict tenant farms to units of large-scale grain production and to exclude livestock enterprises. Fattening a carload of steers in small mixed-farming operations, therefore, rarely occurs in Argentina.

Changes in this matter of organization are taking place, but the tendency is more toward the inclusion of grain farming on estancias than toward adding livestock on the grain farms. More grain is being sown on estancias, even though considerable additional administration is involved. Greater use is being made of corn for forage purposes. The necessity to reseed a somewhat larger acreage each year with alfalfa,

since its average life is less than formerly, involves additional grain farming. Apart from better utilization of the land, a desire to diversify returns has influenced many to undertake the growing of corn and wheat.

A number of large landowners contend that changes of this character are inevitable. In general, when large landowners dispose of a tract of land they prefer to sell it as one piece; but more often than formerly they subdivide their properties into sufficiently small lots to attract owner-operators. Throughout the Cereal and Livestock Zone, especially in the Province of Santa Fe, small owner-operated places tend to become mixed grain and livestock farms.

Dairying in Argentina combines both beef and milk production. There are some Holstein cattle, but the bulk of the milk production is from Shorthorn cows. Beef calves from the dairy farms are raised to an age of 10 months or 1 year and sold to feeders. In the market-milk areas the value of milk production during a year is greater than the value of the calves raised to short yearlings, but in many of the butter and cheese districts the beef calves and milk production represent equal incomes.

Among the three leading beef breeds, Shorthorn, Hereford, and Aberdeen-Angus, the Shorthorn predominates. The high standards of breeding animals is a factor of great importance in explaining the uniformity and high quality of the beef exported abroad and the reputation of Argentine beef in foreign markets. The leading breeders have gone to great efforts and expense in securing some of the best breeding stock of England, Scotland, and the United States. Good herds are to be found in all countries, but the widespread distribution of uniformly good beef cattle is especially characteristic of Argentina.

FEATURES OF MARKETING AND EXPORTATION

Shipments to the packing plants and public market at Buenos Aires and to packing plants at La Plata and Rosario represent the main market movement of cattle. Because of the absence of refrigerated cars and cold-storage facilities in interior cities, there is not a large movement of meat to them from port cities and local slaughter is relied upon for local consumption. The per-capita consumption of meat is high, however, and local slaughter at interior towns and cities is large. It is estimated that the annual cattle slaughter is about 7 million head, of which about 70 percent is for domestic consumption and 30 percent for export.

Five large packing plants in Buenos Aires, La Plata, and Rosario do most of the export business in fresh meat and meat products, do a considerable part of the fresh-meat business in these cities, and manufacture a large volume of canned and special meat products. There is also a governmentally sponsored producer-owned organization, which does not own a packing plant *(frigorífico)* but has operating arrangements with several.

There is only one public stockyard of any size, and that is the municipally owned Liniers Market in Buenos Aires. Cattle receipts at this stockyard are from 2

to 2½ million head annually. These do not represent so large a part of the aggregate market movement of cattle as might be expected owing to the large direct shipments from estancias to packing plants. The latter movement is almost as large as the receipts at Liniers Market.

In 1937, Liniers Market supplied 1,200,000 head to packing plants and 861,000 head to local and interior slaughtering plants. It is a primary source of supplies for small slaughtering plants in Buenos Aires. The market is equipped also with a municipal slaughtering plant built especially to serve small butchers and distributors. Although the packing plants are the largest buyers in the Liniers Market, taking about two-thirds of the cattle, these purchases represent only about 40 percent of the total supplies of the packing plants. Shipments direct from estancias are their largest source of supply. Direct purchases in 1937 were in the neighborhood of 1,919,000 head, or 60 percent of the total cattle bought by the plants.

The direct "on the estancia" purchases by packing plants is a distinctive feature of marketing cattle in Argentina. Clients of the packing companies notify the companies when they have cattle ready for market, and cattle buyers are sent out to classify and grade them. Grading consists of separating the steers that meet the standards for chiller and other grades and frequently of rejecting steers as not ready for market. Four major grades are in use, based upon the commercial use of the animals: chiller, freezer, "consumo" (domestic consumption), and canner.

The range in prices paid for chiller-grade steers is usually small (from 26 to 28 centavos per kilogram on August 15, 1939, equivalent to from 3½ to 4 cents per pound, live weight). Upon agreement as to prices, shipments are made at the direction of the packing companies. There are many lots of less than 100 steers in the direct shipments, but one of the packing companies estimates that about half of its receipts consist of trainload shipments of from 400 to 500 head made by individual feeders. Purchases on the estancias are chiefly of steers - 87 percent in 1937 - and about 70 percent of these steers are of chiller grade for the United Kingdom market. Very few chiller-grade steers are secured in the Liniers Market.

Facilitating the loading of entire trains are cattle cars opening at the ends, which provide a continuous passage from the loading chute to the far end of the train. Twenty steers are loaded to a car. Most points in the fattening area are within a rail haul of 20 hours or less from the packing plants.

SOURCE OF CHILLER STEERS

Because the chiller-grade steer is the best grade, except for a relatively small number of baby beef, and because it holds a dominant position in the export trade to England, transactions in chiller steers are of special interest. The Argentine Rural Society publishes monthly the statistics of packing-plant purchases, by counties, of this grade of from 2- to 2½-year-old fat steers. These data have been compiled into average annual purchases by counties for the 3-year period 1934 to 1937 and are shown in figure 11.

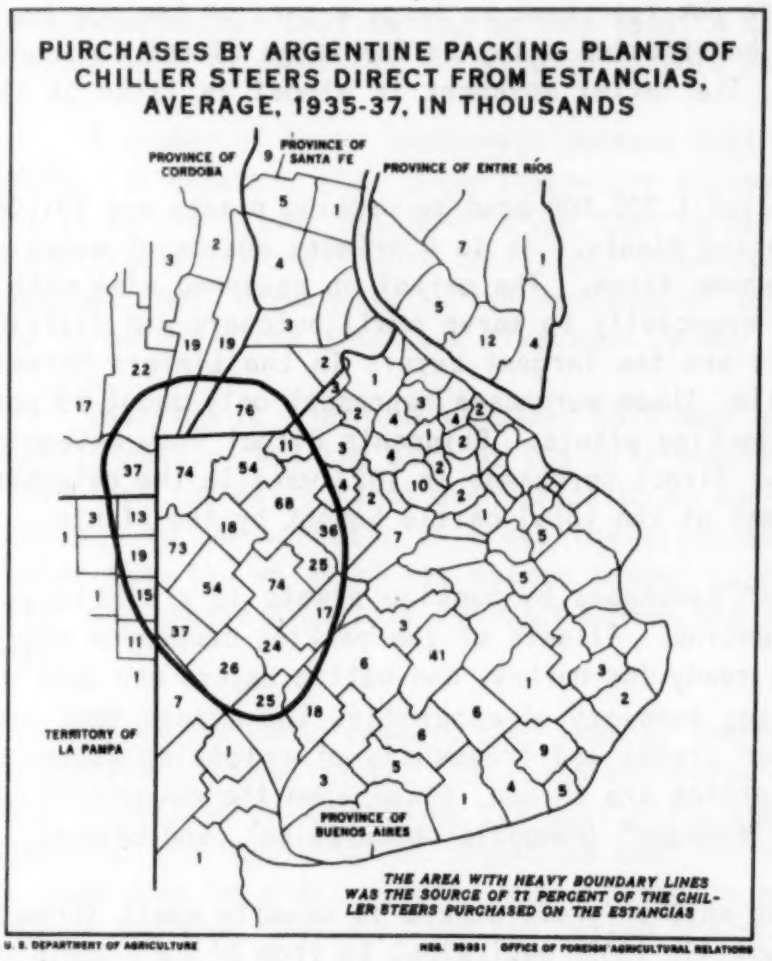
PURCHASES BY ARGENTINE PACKING PLANTS OF CHILLER STEERS DIRECT FROM ESTANCIAS, AVERAGE, 1935-37, IN THOUSANDS
PROVINCE OF CORDOBA
PROVINCE OF SANTA FE
PROVINCE OF ENTRE RÍOS
TERRITORY OF LA PAMPA
PROVINCE OF BUENOS AIRES
THE AREA WITH HEAVY BOUNDARY LINES WAS THE SOURCE OF 77 PERCENT OF THE CHILLER STEERS PURCHASED ON THE ESTANCIAS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 39981 OFFICE OF FOREIGN AGRICULTURAL RELATIONS

Figure 11.

Purchases of chiller steers, although only about one-third of the total purchases by packing plants, show the origin of the kind of cattle that have given Argentina its high reputation as a beef-cattle country. No other data could better reveal the location of the Argentine cattle industry at its best and at its highest degree of development. Here, on alfalfa, rye, and oat pastures, the finishing of 2- or 2½-year-old steers for the English market, with an average weight of 1,015 to 1,030 pounds, takes place on a large and highly specialized scale. The center of the industry is a group of 20 counties in the western part of the Province of Buenos Aires. Each of a number of these counties annually ships from 50,000 to 74,000 chiller steers. The region marked by a heavy boundary line on figure 11 was the source of 77 percent of the total purchases of chiller steers in the years indicated. Here the soil is somewhat sandy and too poor for continuous grain cropping, alfalfa does well, good water at from 18 to 25 feet is quite general, and the prevailing land values of from $16 to $22 per acre are from one-fourth to one-third of the values in the corn zone to the east. This region contains some excellently managed properties.

It is difficult to say what percentage of the steers fattened in this district are bred locally and what percentage are steers shipped in from other districts to be grown out and fattened. Some estancieros buy all the feeder steers they fatten and others fatten only steers bred on their own estancias. The feeder movement into this region is large, however, and it is the opinion of well-informed persons that not more than 30 percent of the steers fattened are bred in the region. From 70 to 80 percent of the fattened steers probably come in as feeders and are pastured here from 5 months to a year. Most of these steers are bought as 1- or 1½-year-old animals with weights ranging from 770 to 880 pounds. Estancia owners buy many feeder steers at consignment sales sponsored by commission firms in the breeding districts, and many steers are also bought direct from estancias in the breeding areas. Estancias within the same region but with poor facilities for fattening steers also supply some of the feeder steers.

A leading Argentine estanciero, who is also familiar with the beef-cattle industry in the United States, has observed that large numbers of United States feeder

steers are bred on large properties of the western ranges and are finished in small lots on relatively small farms in the Corn Belt. He points out that the situation in Argentina is nearly the reverse. Feeder steers are bred on properties smaller, in general, than the fattening properties and are assembled to make up large lots to supply a relatively small number of estancia owners engaged in highly specialized feeding operations on large properties, of which possibly the minimum size is 12,000 acres. Some of the properties exceed 100,000 acres of land and have a carrying capacity of one steer to 2½ acres. The larger properties market from 20,000 to 30,000 fat steers annually.

THE EXPORT TRADE

Chilled, canned, and frozen beef are the largest items in the export trade in beef and meat products. The exports for 1938 were as follows: Chilled beef, 755 million pounds; frozen beef, 226 million pounds; canned meat, 169 million pounds; frozen offal, 64 million pounds; salted beef, 11 million pounds; and meat extract, 4 million pounds.

Chilled beef is exported almost entirely to the United Kingdom. Arrival at packing plants of steers in trainloads for a given day of slaughter, placement in the cold-storage chambers of the packing plants, loading of ocean vessels built especially to handle chilled beef, movement of these vessels on precise schedules, and, finally, careful handling and distribution in the United Kingdom market are all features of this highly organized and efficient export trade.

Quota restrictions in the United Kingdom market have curtailed this outlet. The combined decline in these exports and in exports of frozen beef, shipped chiefly to Germany, Italy, and the United Kingdom, accounted for a 35-percent reduction in total chilled and frozen beef in 1938 compared with 1927. Production adjustments have been made, but in general the supplies and producing capacity in Argentina tend to be excessive.

Because of the very limited market outlet for heavy cuts or for steers weighing in excess of 1,125 pounds, price discounts of 25 percent or more result when with good pastures these prime but overweight steers must be utilized as freezers, or, more usually, as canners. Argentine canned-beef exports are distributed widely, but the United Kingdom and the United States are the principal importers, taking 87 and 45 million pounds, respectively, in 1937. In the absence of other market outlets to absorb all of the large supplies of good beef available in Argentina, the supplies for canning include a high percentage of good grades of beef.

The Argentine Meat Board, a governmental agency, exercises supervision over the meat trade with respect to grading, prices paid to farmers, and other aspects of the industry. Prices for chiller and other grades of steers are usually the result of conferences between packers and the Meat Board.

Because of market restrictions, exports of beef up to the outbreak of the war in Europe were on a definitely lower basis than they had been a decade before. The

country has large unused resources, which could be developed in response to higher prices. Extensive tracts of comparatively good pasture land could be improved and utilized for the production of cattle, herds could be increased greatly in a comparatively short time, and slaughter and packing facilities already exist for the handling of many more animals than are now utilized. Overseas trade, however, has progressively declined since 1931, and market outlets remain the limiting factor in the Argentine industry.

TABLE 1.—*Livestock numbers in Argentina, specified dates*

YEAR	CATTLE	SHEEP	SWINE	HORSES	GOATS
	Number	*Number*	*Number*	*Number*	*Number*
1888 (Oct.)	21,963,930	66,701,097	403,203	4,262,917	[1] 2,863
1895 (May)	21,701,526	74,379,562	652,766	4,445,859	2,749
1908 (May)	29,116,625	67,211,754	1,403,591	7,531,376	3,947
1914 (June)	25,866,763	43,225,452	2,900,585	8,323,815	4,325
1930 (July)	32,211,855	44,413,221	3,768,738	9,858,111	5,647
1937 (June)	33,207,287	43,882,728	3,965,945	8,319,143	4,876

[1] 1875.

Censo Nacional Agropecuario - Ganadería, 1937, published by the Argentine Ministry of Agriculture; and other official sources.

TABLE 2.—*Exports of wool from Argentina, 1875-1938*

[*In terms of wool in grease*]

YEAR	MILLION POUNDS	YEAR	MILLION POUNDS	YEAR	MILLION POUNDS	YEAR	MILLION POUNDS
1875	196	1891	299	1907	334	1923	300
1876	193	1892	334	1908	379	1924	277
1877	210	1893	266	1909	382	1925	255
1878	177	1894	350	1910	325	1926	323
1879	199	1895	435	1911	285	1927	350
1880	210	1896	405	1912	356	1928	281
1881	224	1897	444	1913	259	1929	290
1882	240	1898	478	1914	253	1930	304
1883	256	1899	512	1915	254	1931	316
1884	247	1900	218	1916	267	1932	297
1885	277	1901	493	1917	302	1933	361
1886	294	1902	428	1918	266	1934	256
1887	236	1903	417	1919	348	1935	323
1888	285	1904	364	1920	233	1936	327
1889	306	1905	413	1921	375	1937	273
1890	256	1906	322	1922	438	1938[1]	355

[1] Preliminary.

Compiled from *Anuario del Comercio Exterior de la República Argentina* and *Anuario de la Sociedad Rural Argentina*.

Table 3.—*Exports of cattle and meat from Argentina, 1900-1938*

YEAR	CATTLE	MEAT						
		BEEF			MUTTON AND LAMB, CHILLED AND FROZEN	MEATS, CONSERVED	MEATS, JERKED AND SALTED	TOTAL MEATS
		CHILLED[1]	FROZEN	TOTAL				
	Number	*Million Pounds*	*Million Pounds*	*Million Pounds*	*Million Pounds*	*Million Pounds*	*Million Pounds*	*Million Pounds*
1900	150,550	–	53	53	122	4	36	215
1901	119,189	–	97	97	136	3	52	288
1902	118,303	–	151	151	173	4	48	376
1903	181,860	–	185	185	169	8	28	390
1904	129,275	–	211	211	191	6	25	433
1905	262,681	–	330	330	169	6	55	560
1906	71,106	–	332	332	146	3	10	491
1907	74,841	–	299	299	151	4	23	477
1908	60,916	14	377	391	170	5	14	580
1909	132,450	3	452	455	144	14	25	638
1910	89,733	18	530	548	162	24	20	754
1911	184,112	33	643	676	186	30	26	918
1912	261,416	55	686	741	152	34	19	946
1913	224,911	74	717	791	99	24	8	922
1914	115,556	88	709	797	127	25	5	954
1915	103,207	25	759	784	76	61	(2)	921
1916	51,919	35	889	924	111	85	2	1,122
1917	71,355	84	769	853	86	191	16	1,146
1918	172,551	3	1,068	1,071	109	361	6	1,547
1919	80,298	5	860	865	123	237	17	1,242
1920	72,125	109	790	899	120	28	5	1,052
1921	25,073	321	521	842	142	31	6	1,021
1922	61,653	533	342	875	177	70	13	1,135
1923	119,793	706	465	1,171	175	152	11	1,509
1924	149,666	803	812	1,615	184	182	35	2,016
1925	139,306	821	654	1,475	203	150	30	1,858
1926	184,728	949	500	1,449	148	136	24	1,757
1927	180,658	1,029	521	1,550	183	137	23	1,893
1928	163,282	844	275	1,119	171	148	18	1,456
1929	161,287	789	268	1,057	178	153	11	1,399
1930	124,218	762	217	979	178	139	9	1,305
1931	30,371	777	184	961	184	122	8	1,275
1932	29,003	817	81	898	157	99	4	1,157
1933	38,099	772	69	841	138	124	10	1,113
1934	75,516	771	69	840	107	139	15	1,101
1935	64,379	768	68	836	110	153	17	1,116
1936	72,288	788	87	875	110	166	16	1,167
1937	70,501	771	203	974	114	174	20	1,282
1938[3]	122,730	755	226	981	105	169	15	1,270

[1] Not shown prior to 1908. [2] Less than 500,000 pounds. [3] Preliminary.

Compiled from *Anuario del Comercio Exterior de la República Argentina* and *Anuario de la Sociedad Rural Argentina*.

TABLE 4.—*Exports of principal types of hides and skins from Argentina, 1900-1938*

YEAR	CATTLE	SHEEP AND LAMB	HORSE	GOAT AND KID	TOTAL
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1900	113,072	81,220	(1)	3,710	–
1901	120,823	88,621	(1)	3,948	–
1902	136,467	89,456	(1)	4,019	–
1903	114,663	90,591	7,793	3,851	216,898
1904	115,274	79,939	6,744	4,910	206,867
1905	143,696	65,203	4,533	5,082	218,514
1906	123,625	51,378	4,187	5,000	184,190
1907	119,873	53,360	2,703	2,873	178,809
1908	142,232	60,399	2,936	5,653	211,220
1909	196,384	78,598	6,230	6,462	287,674
1910	200,339	73,748	4,601	4,791	283,479
1911	232,830	69,157	5,253	5,249	312,489
1912	242,993	70,603	2,965	5,802	322,363
1913	191,743	47,017	2,608	5,273	246,641
1914	172,102	32,683	3,073	3,525	211,383
1915	198,033	49,744	5,617	5,434	258,828
1916	219,115	35,874	8,710	6,942	270,641
1917	210,511	33,547	8,710	4,114	256,882
1918	215,780	12,478	4,744	3,210	236,212
1919	223,846	51,662	14,674	7,683	297,865
1920	140,023	33,953	4,087	2,330	180,393
1921	183,513	51,594	2,725	6,409	244,241
1922	310,081	80,602	7,132	5,840	403,655
1923	332,416	47,326	3,190	4,321	387,262
1924	448,762	44,061	5,983	3,880	502,686
1925	370,562	37,465	3,818	6,925	418,770
1926	373,320	37,399	3,900	5,271	419,890
1927	376,912	51,751	4,885	6,157	439,705
1928	313,567	45,880	4,592	5,258	369,297
1929	285,161	44,420	3,697	6,795	340,073
1930	302,024	45,807	3,851	6,018	357,700
1931	257,511	47,646	3,380	4,211	312,748
1932	244,170	44,645	3,470	3,150	295,435
1933	279,069	57,758	5,659	8,616	351,102
1934	273,736	37,793	5,591	4,259	321,379
1935	302,555	43,607	6,821	5,988	358,971
1936	306,287	40,073	10,381	6,299	363,040
1937	313,205	37,319	8,274	5,701	364,499
1938[2]	294,206	40,157	7,277	4,949	346,589

[1] Comparable figures not available. [2] Preliminary.

Compiled from *Anuario del Comercio Exterior de la República Argentina* and *Anuario de la Sociedad Rural Argentina*.

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VOL. IV, No. 2
February 1940

Foreign Agriculture

. . . . . a Review of Foreign Farm Policy, Production, and Trade

Issued Monthly by
UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF FOREIGN AGRICULTURAL RELATIONS
WASHINGTON, D.C.